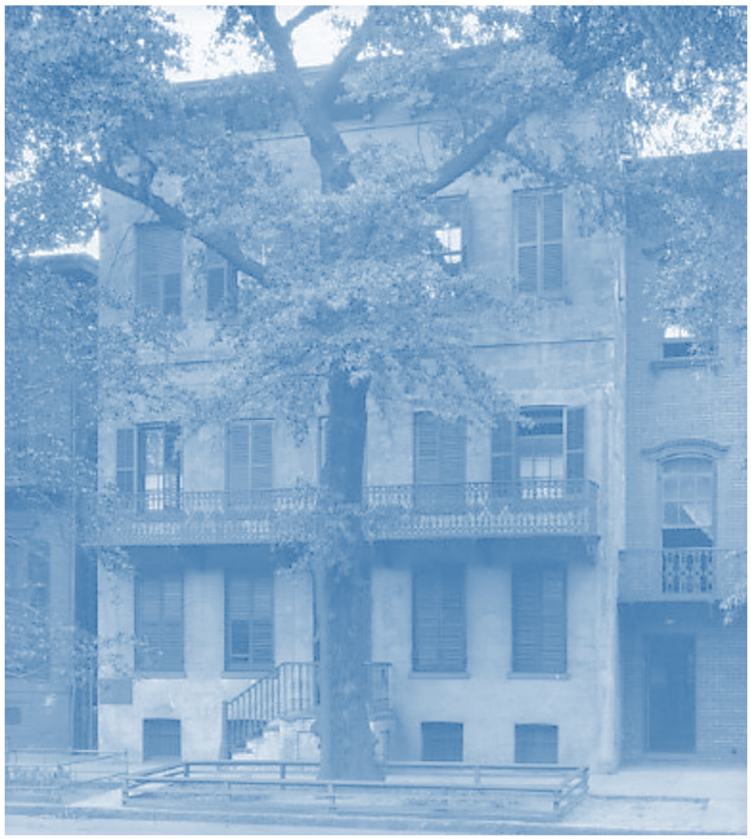

Ground Penetrating Radar Survey at the Lachlan McIntosh House, Savannah, Georgia

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Acknowledgements

Thanks to John F. Ranitz, III, for allowing our research team into his home to perform the GPR study. Appreciation goes to James R. Abraham and Justin Gunther of the Savannah College of Art and Design for recognizing the potential for applying ground penetrating radar technology in the renovations in this historic property. Thanks also to the dozens of SCAD students who participated in the project and who helped to collect the GPR data.

Cover illustration courtesy of Georgia Historical Society, Foltz-Cordray photograph collection. 1922 view of front façade of Lachlan McIntosh House.

Chapter 1. Introduction and History

Introduction

The LAMAR Institute conducted an archaeological investigation of the Lachlan McIntosh House in Savannah, Georgia was conducted on February 11 and 12, 2016, which is documented in this report. SCAD professor Jim Abraham contacted the LAMAR Institute about their renovations in the historic building. The short- and long-term goals included gathering archaeological data from dwelling and its grounds, in order to provide more information about Lachlan McIntosh and others who lived on this property. The LAMAR Institute researchers conducted Ground Penetrating Radar (GPR) survey in two areas of the property. This report documents the LAMAR Institute's GPR survey at the Lachlan McIntosh House.

The Lachlan McIntosh House is situated in Savannah, Chatham County, Georgia. The Lachlan McIntosh House is located in Savannah's National Historic Landmark District. The landmark district was declared in 1966. The house is located at 110 East Oglethorpe Avenue (formerly known as South Broad Street) (Figure 1). The house is currently bounded on the east by a private residence (112 E. Oglethorpe Ave.) on the west by a large brick building (144 Drayton St.) and on the north by East York Lane. A sidewalk separates the dwelling house from the current route of the westbound lane of Oglethorpe Avenue. This property is located within the west one-half of Lot 9, Third Tything, Anson Ward. Oglethorpe Square, which was originally laid out in 1742 and designated "Upper New Square".

The report contains four chapters. Chapter 1 includes an *Introduction and History*. Chapter 2 details the *Research Methods* employed in the study. Chapter 3 is the "heavy lifting" and includes the *Results* of GPR Survey. Chapter 4 presents important *Interpretations* of the project.

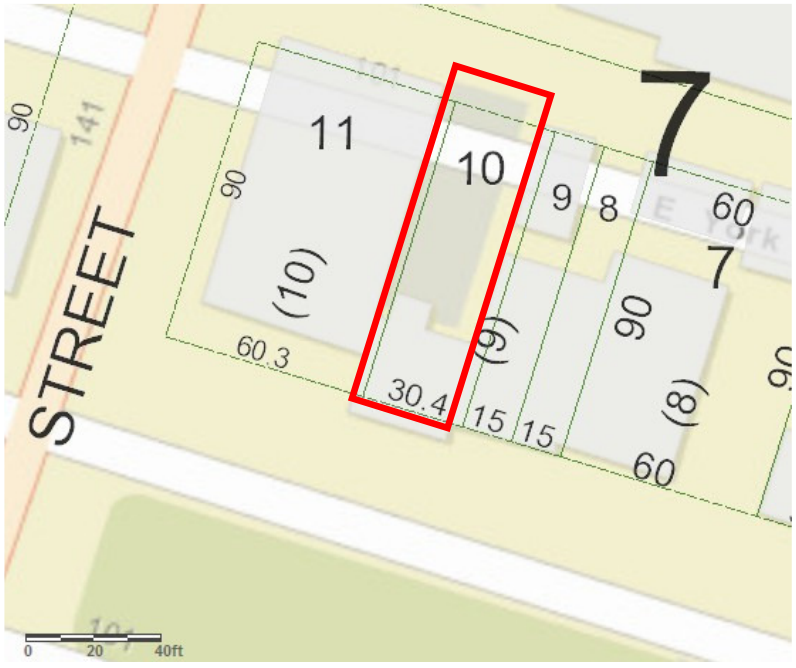

Figure 1. Location of McIntosh House Site at 110 East Oglethorpe Avenue, Savannah, Georgia (Sagis.org 2016).

Land Use History of 110 East Oglethorpe Avenue

In 1733 a new colony was born in America and innovative in many respects. A group of influential politicians, royalty, military leaders, and gentlemen in England who supported prison reform created the Trustees for the Establishment of the Colony of Georgia in America, which was charted by the British Crown in 1731. Led by General James Edward Oglethorpe, the group's original mission was to establish a colony south of the Carolinas where indebted Englishmen and women could prosper. The colony grew to include many that were not in debt, as well as persecuted settlers such as the German Salzburgers. Georgia was unique in many ways. The Trustees forbid slaves and hard liquor, placed an initial limit on the amount of land individuals could own, and created an insightful, geographic town plan for the new town of Savannah in 1733.

General James Edward Oglethorpe's astute and uniquely functional and aesthetically pleasing town plan for Savannah still stands - a testimonial to both the plan's form and function. Initially he established the town into four wards. Each ward contained a center square bordered on the north by two sets of ten city lots each called tithings and on the south by two sets of tythings. This totaled 40 city lots per ward. The eastern and western sides of the square were reserved for church lots and other community structures. The first four wards (and associated squares) were Heathcote Ward (St. James Square now Telfair Square), Derby Ward (Johnson Square now Wright Square), Decker Ward (Ellis Square), and Percivial Ward (Wright Square). All four wards sat on the 40-foot bluff overlooking the Savannah River. Heathcote and Derby wards were located nearest to the bluff, with the other two wards immediately to the south of the first. "Savannah's plan reflects political and organizational considerations of the day. Each ward had tythingmen, who shared guard and other duties. Wards were tied to a larger regional plan of garden and farm lots. The repetitive non-hierarchal placement of wards, squares, and equal-sized lots points to the utopian ideals of the colony. The city plan also proved to be very adaptable and allowed the city to grow and develop. The city used the power gained through municipal ownership of the common to shape growth in the public interest" (ASCE 2014).

Within 30 years of its establishment, Savannah's population had grown to 400 houses, two religious structures, two judicial buildings, and a silk filature (Gamble 1901:33). The populous spilled into areas surrounding the wards. This included a western suburb known as Yamacraw and an eastern suburb that occupied the Trustee's Garden. In the latter Oglethorpe created a place for experimental crops in the town's early years. Both the eastern and western suburbs accommodated an additional 160 houses (Gamble 1901:33). An additional need for town expansion was met in 1770, when the town plan grew by two more wards for a total of six wards.

The McIntosh house is located on the West half of Lot 9, Third Tything, Anson Ward. The Trustees of Georgia granted the property containing this town lot (listed as Lot 229) to Steven Marauld, about 1736. Anson Ward was not created until 1742, however. Steven Marauld arrived in Georgia about December 1735. Steven was not successful in Georgia, as his lot was "Swamp overflow'd & cultivated nothing" He deserted Georgia for Carolina in January 1738/9 and left no record as to how he disposed of the property in Savannah. (Egmont 1737-1739:137-L (350); Coulter and Saye 1949:87).

Royal Governor James Wright granted the town lot containing the present dwelling to William Patterson on September 7, 1762 (Colonial Grant Book D; Colonial Records of Georgia 8:603, 734). Patterson's ownership of the lot was short lived. On September 20, 1762, 13 days after receiving the land grant,

William Patterson conveyed the property to Jonathan Graham, James Graham and James Mossman (Colonial Deed Book C2:875). Jonathan and James Graham and James Mossman conveyed the property to Jonathan Eppinger on December 14, 1764 (Colonial Deed Book C2:877; Schreck n.d.).

Johann [aka, John or Jonathan] Friedrich Eppinger was born in Wieden, Wurtemburg, Germany in August 1730. He married Anna Barbara Mayer, who was born July 10, 1732, also in Wurtemburg. The Eppingers moved to London, England on May 1, 1748. From there they emigrated to America, arriving in North Carolina in 1749. The Eppinger family moved to Savannah Georgia, on October 15, 1759 (McCall 1931:514). Johann was a member of the Ebenezer congregation in St. Matthews Parish, where he was active by 1759 (Jones 1986; Jones and Exley 1991:15). Savannah historians noted that Johann Eppinger built the home now located at 110 E. Oglethorpe Avenue prior to 1747 (Lee and Agnew 1869:72). In 1897, South Broad Street became Oglethorpe Avenue (Gamble 1901:41). Primary documents supporting this claim, however, have not been located and other historical records do not support Eppinger being in the Savannah area until about 1759.

Johann (John) Eppinger died in January 1777 in Savannah, Georgia. His will was probated on January 28, 1777. John Eppinger, late of Savannah, is identified as a "bricklayer, deceased" in an April 26, 1781 newspaper notice (*Royal Georgia Gazette* 1781). His estate remained unsettled for several years after the Revolutionary War. In September 16, 1790 (McCall 1931:514; *Georgia Gazette* 1790:3), Barbara Eppinger and John Springer were listed as his Executrix and Executor, respectively. Final notices regarding the settlement of Eppinger's estate, which listed Barbary Eppinger and John Eppinger as Executrix and Executor, were published in Savannah on December 8, 1797 (*Columbian Museum* 1797:2). On April 1, 1797 Barbara Eppinger, James Eppinger, B. Shaffer, J. Robert, and J. Robert, Jr. conveyed the property to James M. Eppinger (Chatham County Deed Book R:58).

On March 21, 1834 R.R. Cuyler, Administrator for J. Eppinger and M. Eppinger, conveyed the Eppinger property to James Eppinger and Jacob Shaffer (Chatham County Deed Book 2D:225). The Eppinger property was transferred from James Eppinger to Jacob Shaffer on July 2, 1834 (Chatham County Will Book 2D:429). On May 23, 1835 Jacob Shaffer mortgaged the property to Hy Haupt (Chatham County Mortgage Book 2J:205).

Anna Barbara Eppinger, widow of Johann Eppinger, died June 5, 1812 (*Savannah Republic* 1812). Johann Eppinger, son of Johann (born 1730), was a bricklayer like his father (Jones 1986:22-23). He was born in Savannah, July 21, 1765 and died in Savannah July 1823. He made his will on June 19, 1823. His estate was finally settled in 1849 (McCall 1931:515). The *Columbian Centinel* newspaper in Massachusetts published death notices for John Eppinger and John Eppinger, Jr. The former died in Savannah on June 16, 1813, while the latter, who was listed as, "Esq., late of the District of Ga., a Marshal" died in Savannah on August 9, 1823 (Ancestry.com 2016).

Brigadier General Lachlan McIntosh, whose family is associated with the property following the American Revolution, has an unclear claim of ownership for the property. General McIntosh died in 1806 at his home in St. James Square in Savannah (Ancestry.com 2016). As the later land records indicate, the Eppinger family held ownership of the land until 1834. If McIntosh resided in this house, he may have been a boarder rather than a homeowner.

Local tradition holds that the Georgia State legislature met at the McIntosh house, or "Eppinger's Long room", after July 11, 1782 and prior to the State legislature's removal to Augusta, Georgia (Lee and Agnew 1869:72; Wilson 1889:67). Around 1869 an "Eppinger house" was occupied by a Mr. S. Davis. The street location that historians provide for this house is on the northeast corner of Jefferson Street on

South Broad Street, however, which is a different location from 110 E. Oglethorpe Avenue (Lee and Agnew 1869:72). These authors may be in error, as the later owners of 110 South Broad Street noted a connection between their house and that owned by Eppinger. McCall (1931:515) states that, "the Eppinger House, was on the south-east corner of Jefferson Street and was used as Public House. After his [John Eppinger, born 1730] death, his son used it as a residence and opened up a public house in the Old Brick house on South Broad Street, the oldest brick house in Savannah and where the Legislature of Georgia held its sessions". Wilson (1889:67) wrote in 1889 that the McIntosh house was, "on the north side of South Broad street, the third door east of Drayton street, now the home of John D. Robinson, Esq.", and that, "till within a few years it preserved its original aspect.

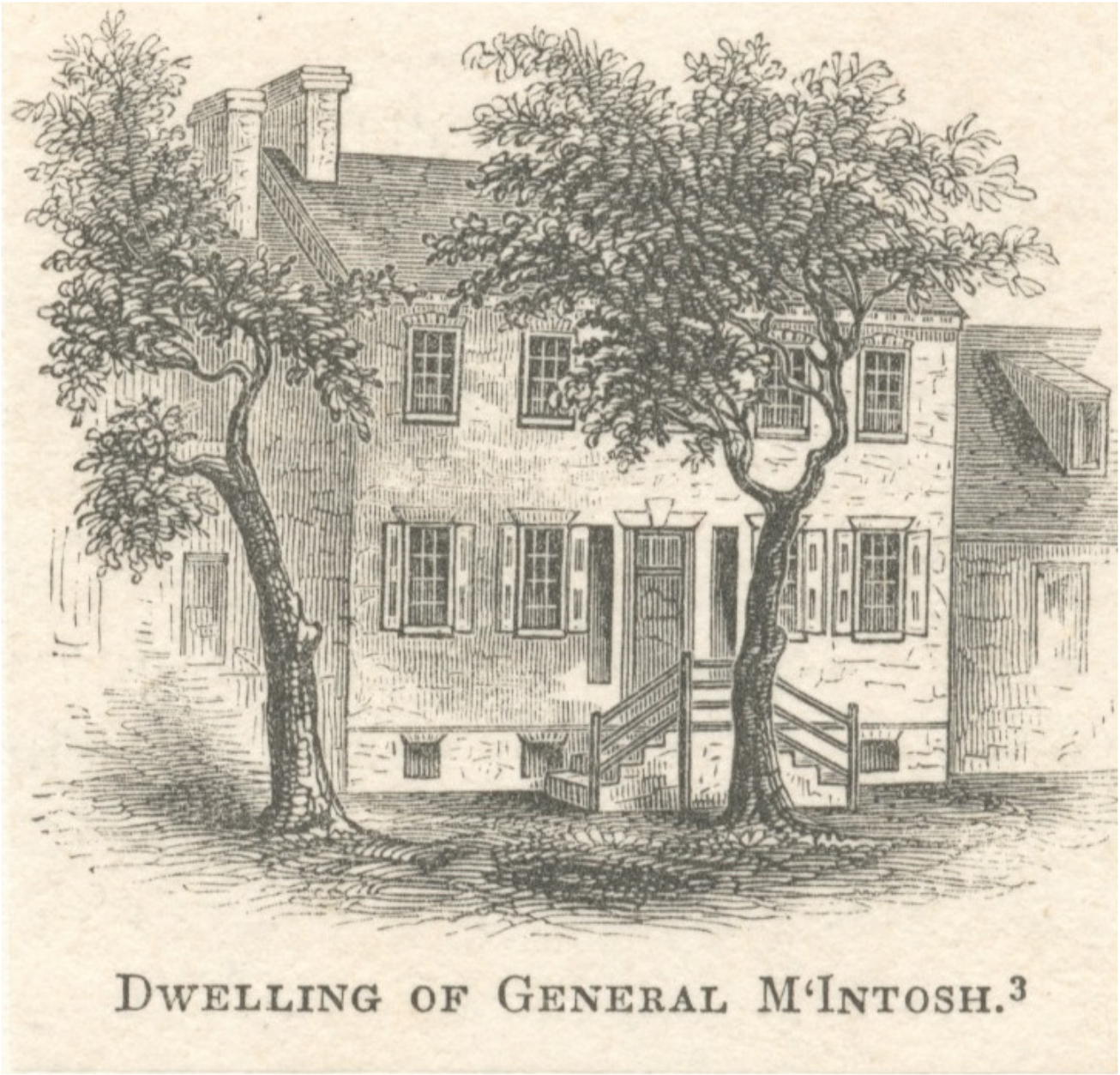

Figure 2. Dwelling of General M'Intosh (New York Public Library 2020).

John D. Robinson, Sr., the father of Charles V. Robinson purchased the dwelling in the mid- to late-19th century (Wilson 1889:67). One later newspaper source claims that John D. Robinson, Sr. purchased the house in 1854, although this has not been confirmed with primary documents. John Robinson, age 44,

and his family lived in Savannah in 1870 (Ancestry.com 2016). John was a store clerk with real estate valued at $4,000 and $500 in personal property. His household included: Ann, age 42, Annie, age 16, Mary, age 13, Katie, age 11, John, age 6 and Charles, age 4. Both John and his wife Ann were born in Ireland and all of their children born in Georgia. The 1880 Federal Census lists the John Robinson household at 107 South Broad Street. It included John Robinson, age 53, Anna Robinson, age 54, daughters Annie, Mary and Catherine Robinson, ages 26, 24 and 22, and sons, John and Charles Robinson, ages 16 and 14, respectively. A boarder, Bernard T. Burchardie, age 30, also lived with the Robinsons. John Robinson's occupation was listed as cotton shipper. J.D. Robinson, age 74, his wife Anne S. Robinson, age 75, and son Charles V. Robinson (born in May 1866, listed as age 34), and a roomer named P. Huger, age 45, were living at 110 East Broad Street when they were enumerated in the 1900 Federal Census for Chatham County (Ancestry.com 2016).

Charles V. Robinson, youngest son of John D. Robinson, Sr., owned the property by 1910. The 1910 Federal Census for Chatham County lists Charles V. Robinson as the head of household at 110 Oglethorpe Avenue. He was listed as a 36-year old, single, white male who worked as a clerk for the railroad. His parents both were listed as born in Ireland. Seventeen other people were listed in the residence and these include:

Name	Age
Mary Kiernan	47
Eugenia Kiernan	14
Ruth Kiernan	12
John D. Robinson, Jr.	18
James Robinson	16
George J. Swint	38
May C. Quint	28
Samuel C Downs	73
Marguerit Downs	73
William T. Moyers	20
Thomas R. Carin	26
Percival R. Cohen	59
Louis J. Mcleod	23
Ben H. Ingram	25
James M. Fleming	54
Lucius A. Smith	41
Edward A. McCarthy	21

(Ancestry.com 2016).

Figures 3-6 show a series of Sanborn Fire Insurance maps of that portion of Savannah containing the study property (Sanborn Map Company 1884-1916). In all four figures, Drayton Street is shown on the left side (west) and South Broad Street (later, Oglethorpe Avenue) is to the bottom (south). The study property is located on the second lot east (right) of Drayton Street.

Figure 3. Portion of 1884 Sanborn Fire Insurance Map, Showing Study Location (Sanborn 1884).

Figure 5. Portion of 1898 Sanborn Fire Insurance Map, Showing Study Location (Sanborn 1898).

Figure 4. Portion of 1888 Sanborn Fire Insurance Map, Showing Study Location (Sanborn 1888).

Figure 6. Portion of 1916 Sanborn Fire Insurance Map, Showing Study Location (Sanborn 1916).

The 1920 Federal Census for Chatham County lists Charles V. Robinson as the head of household at 110 East Oglethorpe Avenue. He was listed as a 50-year old, single, white male who worked as a clerk for the railroad. Others living in the house in 1920 were: Mary Kiernan, age 52, William Robinson, age 16, Harry Robinson, age 17, Eugenia Kiernan, age 23, Ruth Kiernan, age 21, and John J. H. Kiernan, age 26 (Ancestry.com 2016).

In a July 30, 1919 letter from Senora Ana R[obinson] de Janer to her brother, Charles V. Robinson, she refers to, "cannon balls discovered in the spaces between floors of bedrooms and ceiling of parlour," in the house (GDNR, HPD files). Ana Robinson was raised in the house, so she was undoubtedly familiar with architectural and historical aspects of the dwelling.

The Foltz Photography Studio photographed the front of the Lachlan McIntosh House in 1922 (Foltz-Cordray Manuscript Collection 1922). A portion of that image is reproduced on the report cover.

In November 1956 the McIntosh house was sold at public auction in order to settle the estate of John D. Robinson, Sr., deceased (Haile 1958:1; Hunter 1956). John D. Robinson, age 8, appears in the household of John D. and Mary E. Robinson in the 1900 Federal Census for Chatham County. Their house was on Gordon Street near Habersham Street, which is several blocks east of the McIntosh house. John D. Robinson [Sr.] is listed as born in September 1863 (Age 36) and the son of Irish parents. A Charles V. Robinson, age 4 months, is listed as a son of John [Sr.] in the 1900 census. The Charles V. Robinson who owned the dwelling in 1910 and 1920 enumeration is possibly John, Jr.'s brother.

Walter Hartridge, former president of the Georgia Historical Society, noted in 1958 that the dwelling avoided destruction by major fires in 1796 and 1820. Hartridge stated that the house was built in the 1760s by John Eppinger, a professional builder, as a public house (*Savannah Morning News* 1958). Architect Stephen P. Bond created measured drawings of the Lachlan McIntosh House in 1958. In 1959 the Historic Savannah Foundation sold the residence at 110 East Oglethorpe Avenue to the law firm of Pierce, Ranitz & Lee (*Savannah Morning News* 1959:2D). The property is presently owned by John F. Ranitz, III and others (Sagis.org 2016).

Chapter 2. Research Methods

The project incorporated specific methodology in its research, field work, laboratory analysis, and report writing. This methodology met or exceeded the U.S. Secretary of Interior Standards for archaeological investigation. Methods employed are detailed below.

Historical Research

LAMAR Institute researchers had previously gathered some historical information concerning the McIntosh house from various sources. Particularly, this included a review of the vertical files on the building at the Historic Preservation Division, Georgia Department of Natural Resources. Additional information was gleaned from internet searches of many archives, online libraries and digitized maps and photographs. The LAMAR Institute's Charles Frederick Gnann Library in Rincon, Georgia also was consulted.

Fieldwork

Following research, the preparation of a Research Design, and project planning, LAMAR Institute archaeologists conducted the Ground Penetrating Radar (GPR) survey. The GPR survey was conducted on February 11 and 12, 2016 by GPR specialist and archaeologist Mr. Daniel Elliott, who was assisted by SCAD students and Rita Folse Elliott. Fieldwork also included a PowerPoint overview and introduction to the SCAD students about archaeology, GPR, and the goals and methods of the project.

Ground Penetrating Radar, or GPR, uses high frequency electromagnetic waves to acquire subsurface data. The device uses a transmitter antenna and closely spaced receiver antenna to detect changes in electromagnetic properties beneath them. The antennas are suspended just above the ground surface and the antennas are shielded to eliminate interference from sources other than directly beneath the device. The transmitting antenna emits a series of electromagnetic waves, which are distorted by differences in soil conductivity, dielectric permittivity, and magnetic permeability. The receiving antenna records the reflected waves for a specified length of time (in nanoseconds, or ns). The approximate depth of an object can be estimated with GPR, by adjusting for electromagnetic propagation conditions.

The GPR sample blocks in this study area were composed of a series of parallel transects, or traverses, which yielded a two-dimensional cross-section or profile of the radar data. These samples are termed radargrams. This two-dimensional image is constructed from a sequence of thousands of individual radar traces. A succession of radar traces bouncing off a large buried object will produce a hyperbola, when viewed graphically in profile. Multiple large objects that are in close proximity may produce multiple, overlapping hyperbolas, which are more difficult to interpret. The GPR signals that are captured by the receiving antenna are recorded as an array of numerals, which can be converted to gray scale (or color) pixel values. The radargrams are essentially a vertical map of the radar reflection off objects and other soil anomalies. It is not an actual map of the objects. The radargram is produced in real time and is viewable on a computer monitor, mounted on the GPR cart. Figure * is a diagram of how GPR works (Adapted from gprtechnika.pl 2020).

GPR has been successfully used for archaeological and forensic anthropological applications to locate relatively shallow features, although the technique also can probe deeply into the ground. The machine is adjusted to best probe to the depth of interest by the use of different frequency range antennas. Higher frequency antennas are more useful at shallow depths, which is most often the case in archaeology. Also, the longer the receiving antenna is set to receive GPR signals (measured in nanoseconds, or ns), the deeper the search.

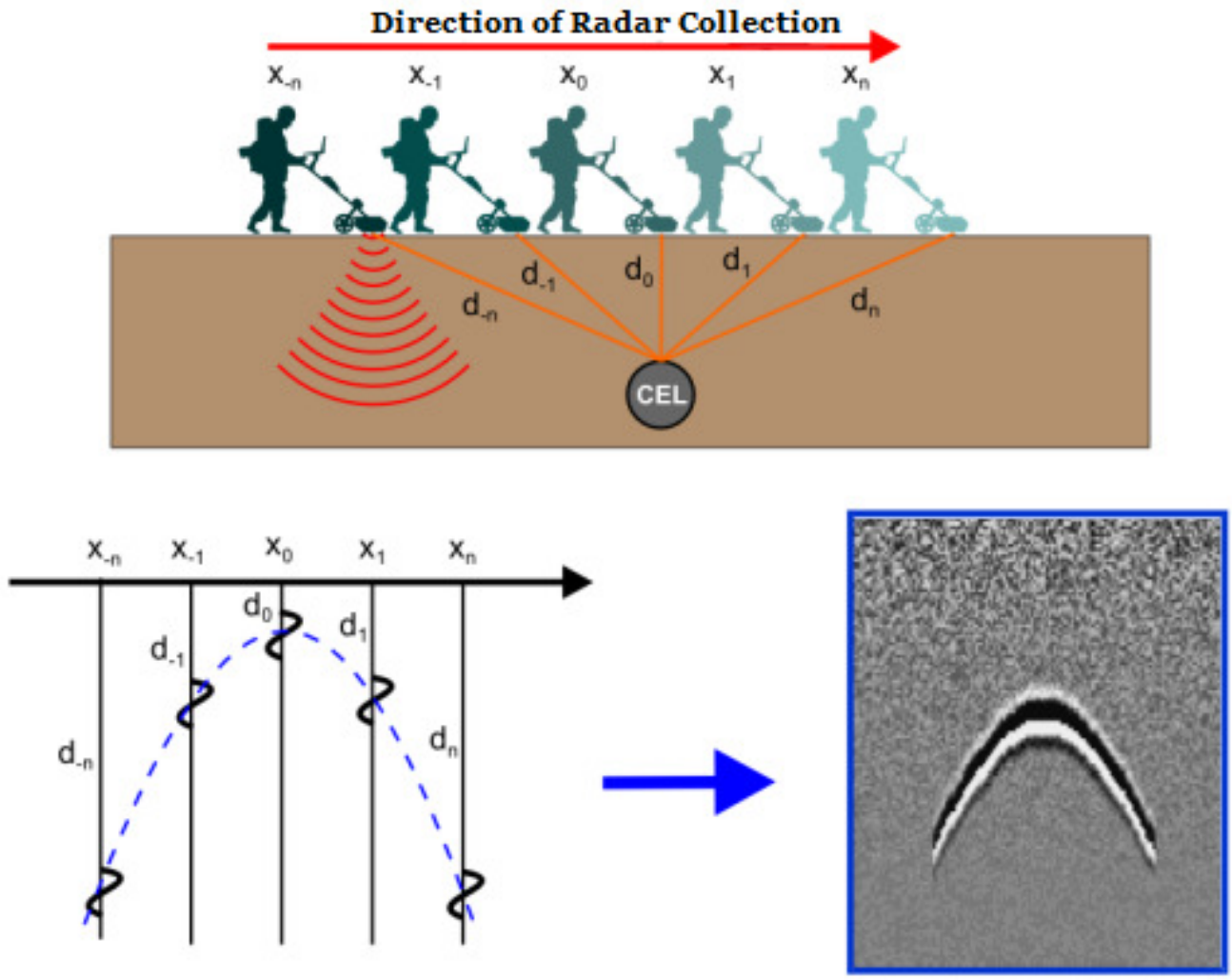

Figure 7. Schematic Diagram of How GPR Works (Adapted from gprtechnika.pl 2020).

GPR signals cannot penetrate large metal objects and the signals are also significantly affected by the presence of salt water. Although radar does not penetrate metal objects, it does generate a distinctive signal that is usually recognizable, particularly for larger metal objects, such as a cast iron cannon, underground storage tanks or man-hole covers. The signal beneath these objects is often canceled out, which results in a pattern of horizontal lines on the radargram. For smaller objects, such as a scatter of nails, the signal may ricochet from the objects and produce a confusing signal. Rebar-reinforced concrete, as another example, generates an unmistakable radar pattern of rippled lines on the radargram.

Ground penetrating radar has been proven successfully to locate buried cultural and natural features without the need for unnecessary or excessive ground disturbance, thereby eliminating or reducing the need for costly "prospecting" that frequently defines traditional archaeological survey and research. GPR, when used in conjunction with accurate position fixing methods, either GPS or standardized transects, can provide location and depth information of buried objects or features. Using the accurate location information available, anomalies can be mapped and targeted for ground-truthing, which would require minimal ground disturbance, saving time, cost, and preserving the remainder of the site (Conyers and Goodman 1997; Conyers 2004). The effectiveness of GPR in various environments on the North American continent is widely variable and depends on soil conductivity, metallic content, and other pedo-

chemical factors. Generally, Georgia's coastal soils have moderately good properties for its application.

Traditional archaeological techniques involve digging, thereby destroying part of the object that is being investigated. Additionally archaeological investigations based on digging often miss important features. Remote sensing can assist traditional archaeological practices by identifying the locations of features prior to excavation, so that excavation efforts are more efficient, resulting in recovery of more data at less expense. Ground-truthing to identify remote sensing anomalies can be directed to the area of interest and unnecessary destruction of features and wasted efforts at non-productive locations can be minimized.

The survey consisted of collecting radar information from two rectangular block samples, Block A in the rear yard of the dwelling, and Block B in the floor of the southwest corner room in the interior of the building. The surveyors used a MALA GeoScience RAMAC X3M radar unit attached to a computer monitor. Radargrams were collected unidirectionally to minimize machine distortion of the radar data. Radargram collection began in the southwestern corner of each grid and the radargrams progressed to the east. Grid North for the survey is oriented approximately 22 degrees east of Magnetic North.

Block A measured 21.9 m north-south by 8 m east-west (Figure 2). Seventeen radargrams were collected within Block A and these were spaced 50 cm apart. Survey in the northeastern corner of Block A was hampered by vegetation. The survey collected a total of 354.64 m of radar information. The schematic plan of these radargrams is shown in Figure 3. That portion of Block A located more than 15.5 meters north of the 0,0 point includes East York Street Lane behind the house. A 500 MHz shielded antenna mounted on a wheeled cart was used for the survey of Block A. Ground conditions within this sample consist of mostly grass with some areas paved with asphalt, brick and concrete. No subsurface excavation was attempted. Machine settings for Block A: Radargram orientation: North; Antenna Type: 500 MHz (shielded); Radargram spacing: 50 cm; Number of samples per scan: 512; Time window: 62.2 ns, and Sampling frequency: 7462.13 MHz.

Block B measured 3.2 m north-south by 4 m east-west (Figure 4). Twenty radargrams were collected within Block B and these were spaced 20 cm apart. The survey collected a total of 84 m of radar information. The schematic plan of these radargrams is shown in Figure 5. The wall immediately west of Block B contains a massive masonry chimney that is possibly original to the building. An 800 MHz shielded antenna attached to a small calibrated wheel was used for the survey of Block B. The floor of this room consists of carpet above concrete. The elevation of the floor is below current street level, although this floor is not considered a basement. Machine settings for Block B: Radargram orientation: North; Antenna Type: 800 MHz (shielded); Radargram spacing: 20 cm; Number of samples per scan: 512; Time window: 53.8 ns, and Sampling frequency: 8954.55 MHz.

Reporting

The LAMAR Institute has documented the first ground penetrating radar (GPR) survey at the McIntosh house at 110 East Oglethorpe Avenue in Savannah, Georgia. This report complies with Federal and Georgia standards for archaeological reporting. An electronic version of this report is being made available to the public via the LAMAR Institute's internet website (http://thelamarinstitute.org). Copies of the report also will be deposited with the Georgia Department of Natural Resources, Historic Preservation Division; the Georgia Archaeological Site File, Laboratory of Archaeology, University of Georgia; Savannah College of Art and Design; the Georgia Department of Archives, and the Georgia Historical Society.

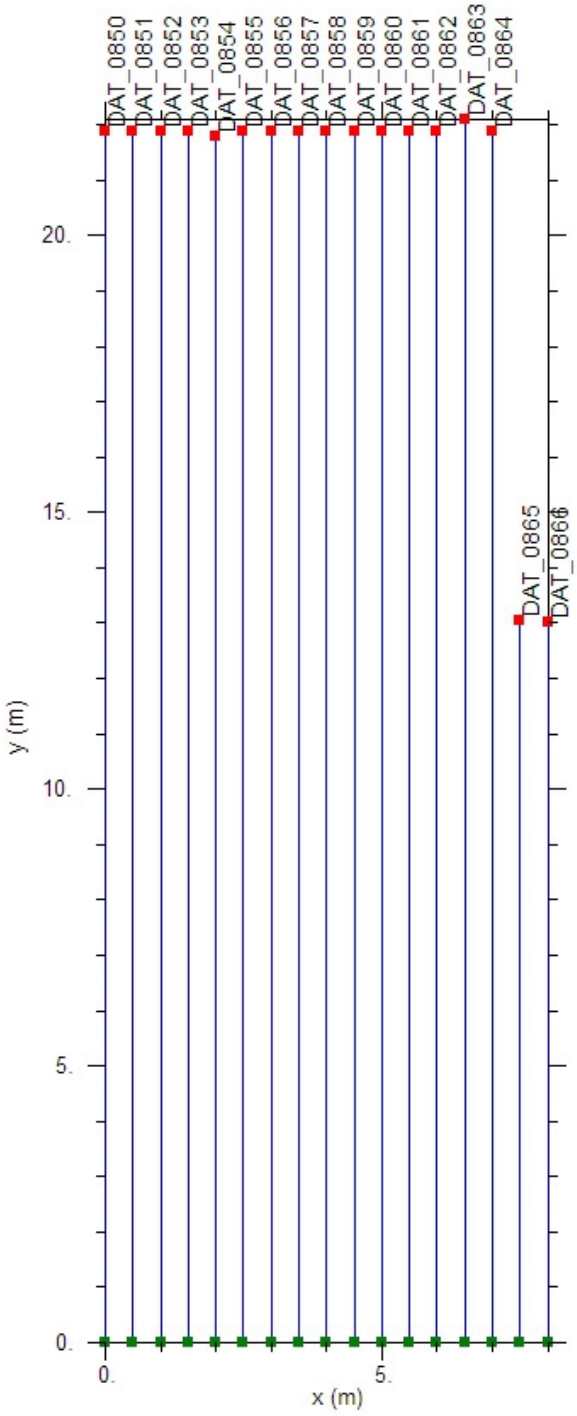

Figure 8. Radargram Plan, Block A, McIntosh House.

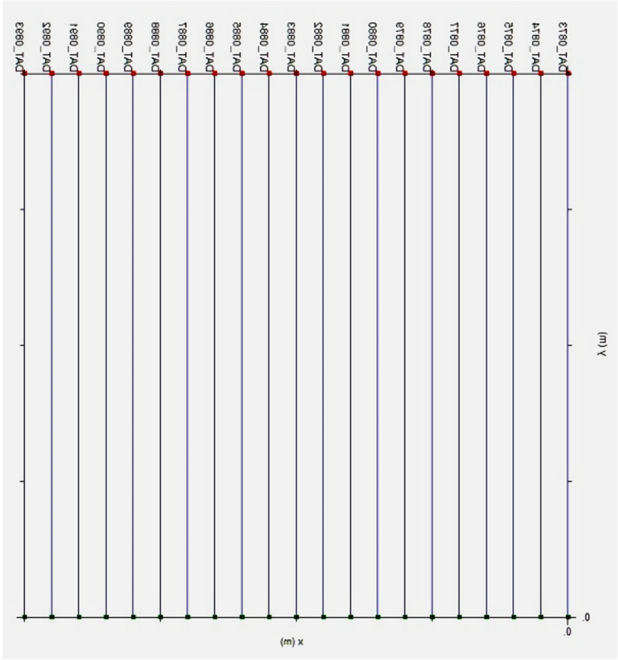

Figure 9. Radargram Plan, Block B, McIntosh House.

Chapter 3. Results

Rear Yard-GPR Block A

GPR Block A explored major portions of the rear yard and East York Street Lane at 110 East Oglethorpe Avenue. This sample was nearly rectangular and measured 21.9 m north-south by 8 m east-west. This sample covered most of the yard area, north of the rear stepped entrance. The section of the East York Lane was included to map the various public utilities and other disturbances within this component of Savannah's cultural landscape. Figures 6 and 7 provide examples of two GPR plan views of Block A. Figure 8 shows a portion of a radar profile that contains a particularly large, strong radar reflection. This reflection was visible in plan and profile and it is an area of interest. Figures 9 and 10 are isometric perspective views of the radar results in Block A.

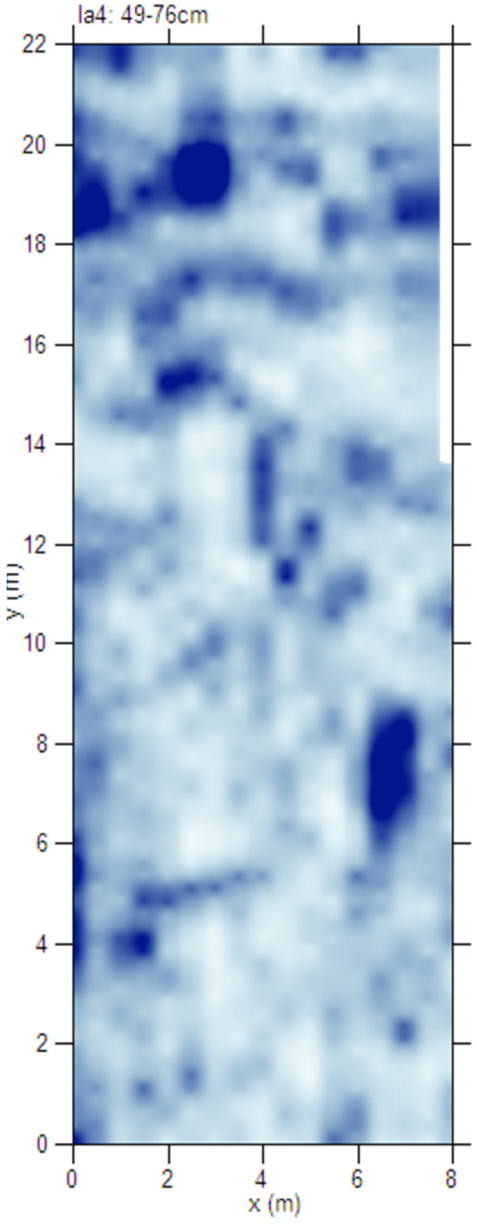

Figure 10. GPR Plan at 49-76 cm Depth, Block A, Rear Yard, McIntosh House (Grid North is up).

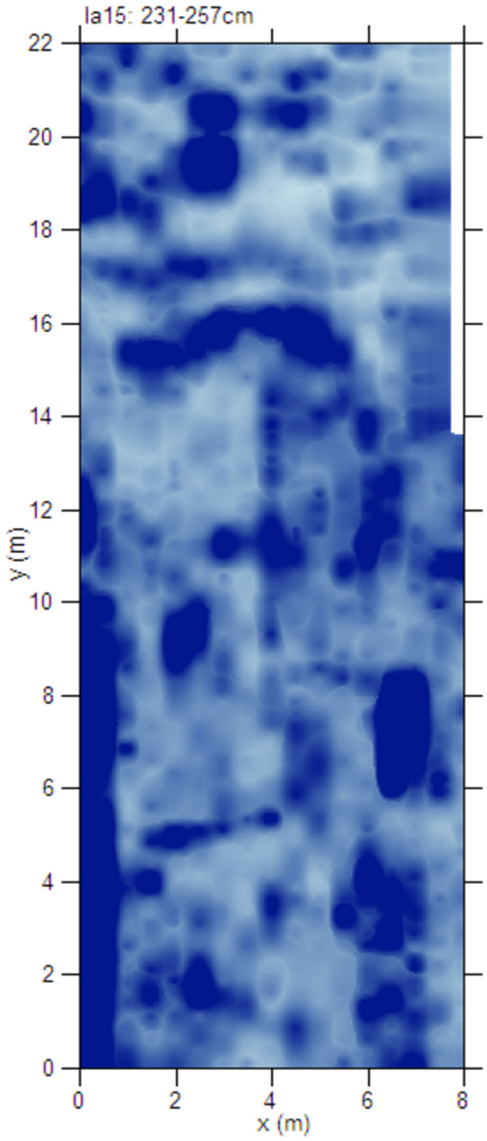

Figure 11. GPR Overlay Plan Map of Block A, Rear Yard, McIntosh House (Grid North is up).

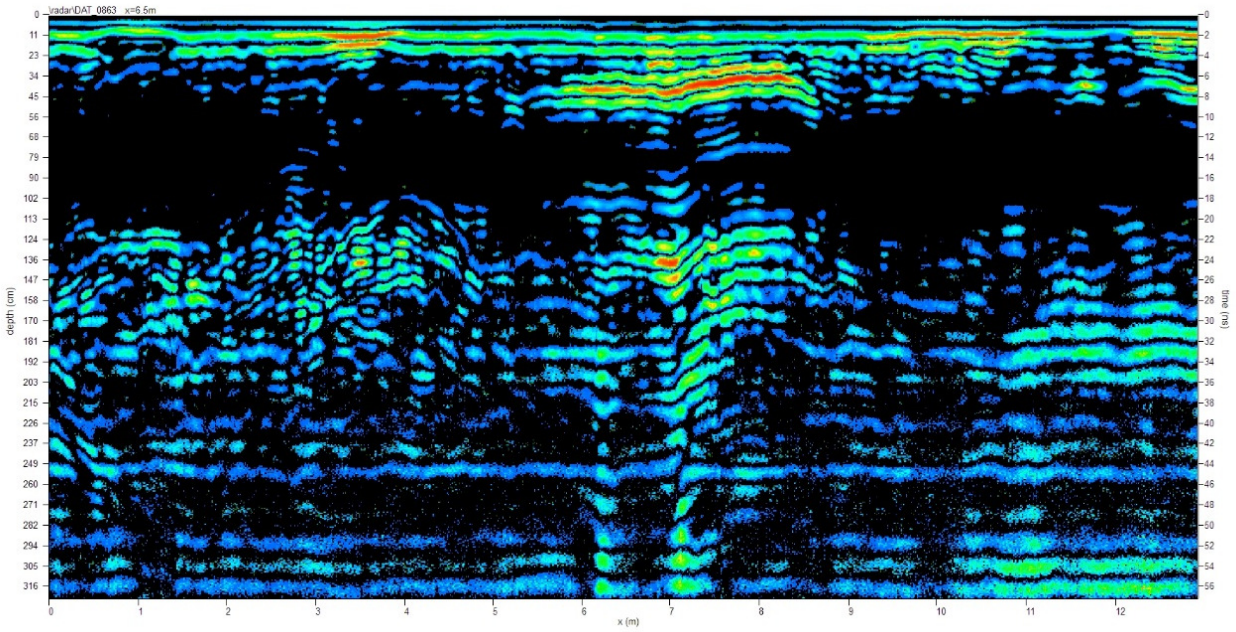

Figure 12. Strong Anomaly Reflections in Radargram 863, Block A, McIntosh House.

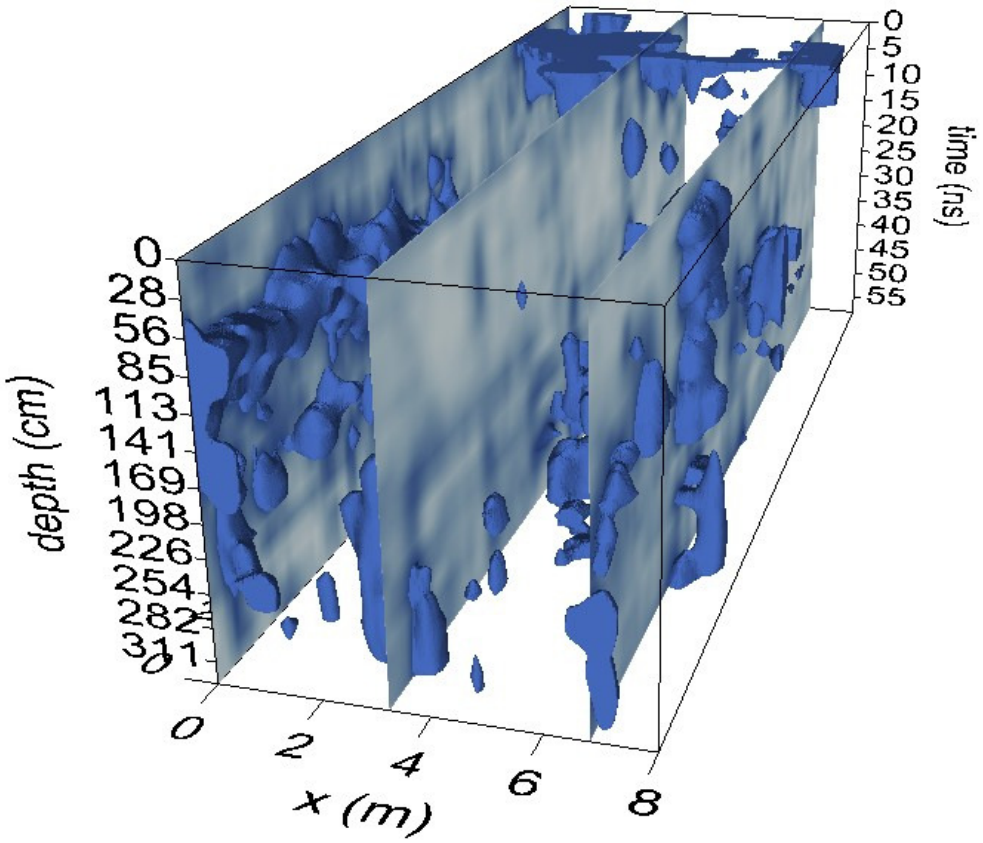

Figure 13. Isomorphic Perspective View of GPR Block A, Rear Yard, McIntosh House.

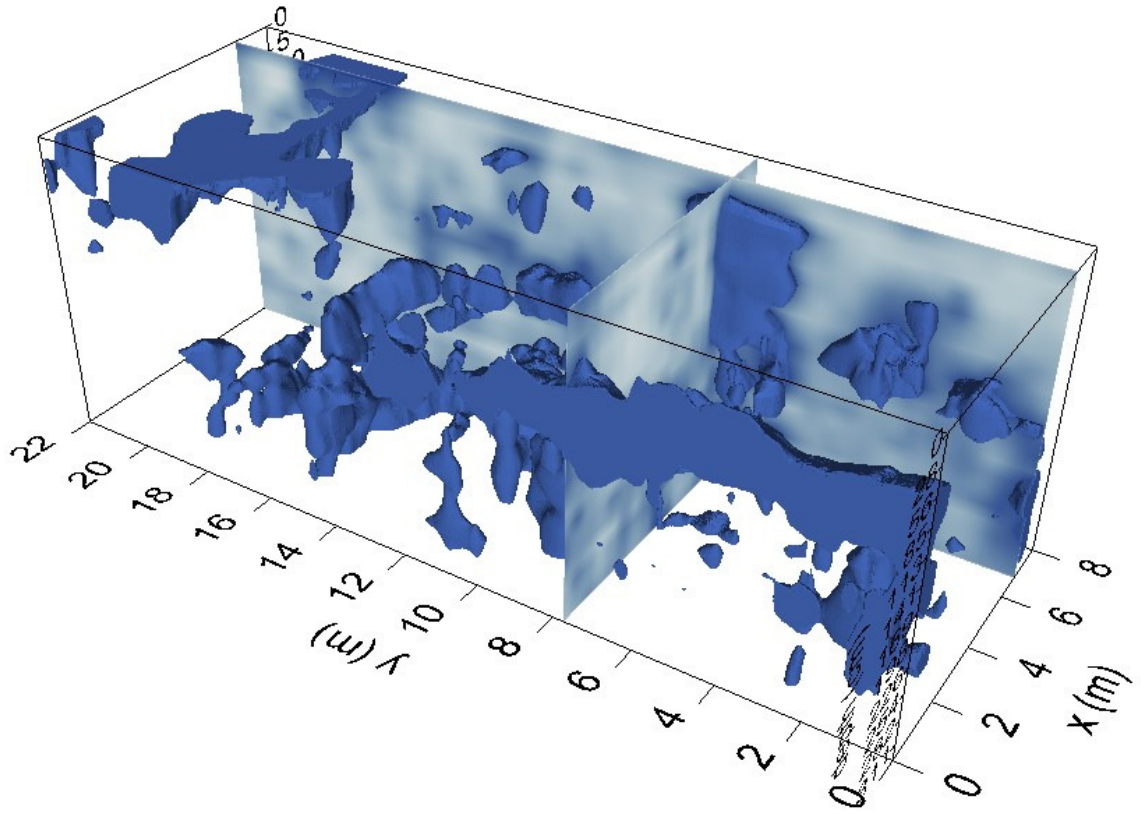

Figure 14. Isomorphic Perspective View of GPR Block A, Rear Yard, McIntosh House.

Interior Room-GPR Block B

The LAMAR Institute GPR team conducted survey in one interior room of the McIntosh house. The southwest corner raised basement/1st floor room proved to be the best candidate for this work since it was the least cluttered with demolition debris. Because of the tight quarters a different configuration of GPR equipment was used and this allowed greater mobility and coverage. GPR Block B was a 4 m by 4 m sample. By using the 800 MHz antenna in the survey of Block B more detailed radar information was gathered at shallow depths than with the 500 MHz antenna. This higher frequency antenna did not allow for the depth penetration, however, observed in the Block A sample. Figures 11 and 12 are examples of two GPR plan views. Figure 11 shows the radar reflections immediately beneath the floor surface. In this image a strong radar reflection lies along the western edge of the GPR block. Figure 12 is a composite (overlay view) that combines radar reflections from many levels. Overlay maps frequently provide the best fit for understanding the GPR data but in this case the overlay map produced muddy results. Figure 11 shows three profiles within Block B. Figure 12 is an isometric view of Block B.

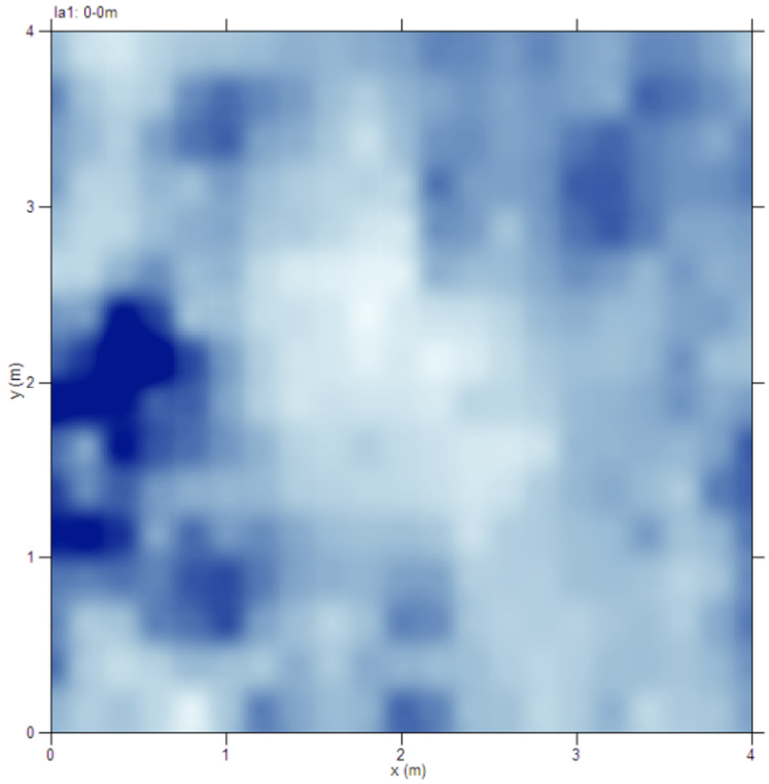

Figure 15. GPR Plan of Block B, Near Surface (Grid North is up).

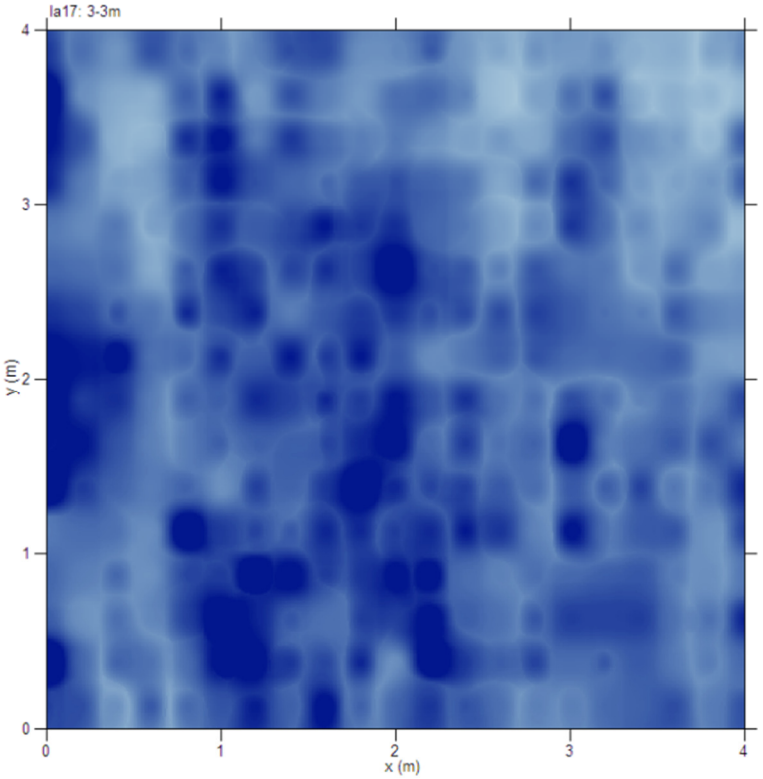

Figure 16. GPR Overlay Plan Map, Southwest Room, McIntosh House (Grid North is up).

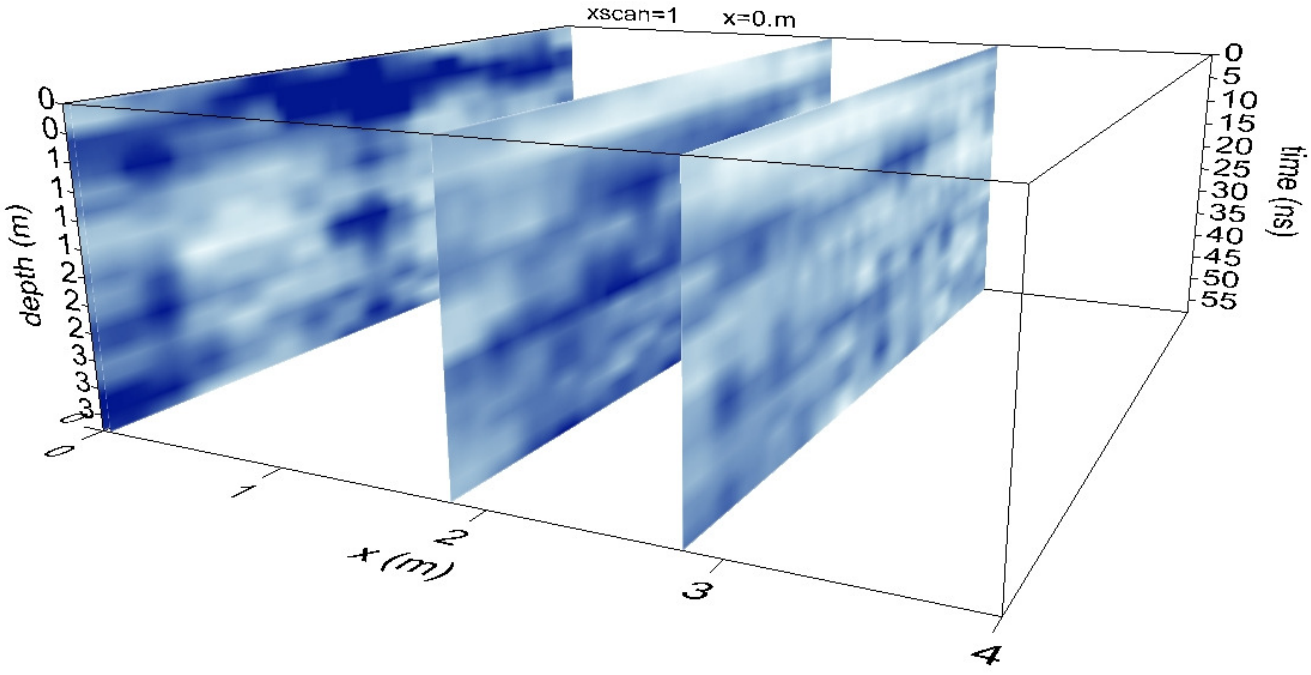

Figure 17. Perspective View of Three Profiles in GPR Block B, Facing Northwest.

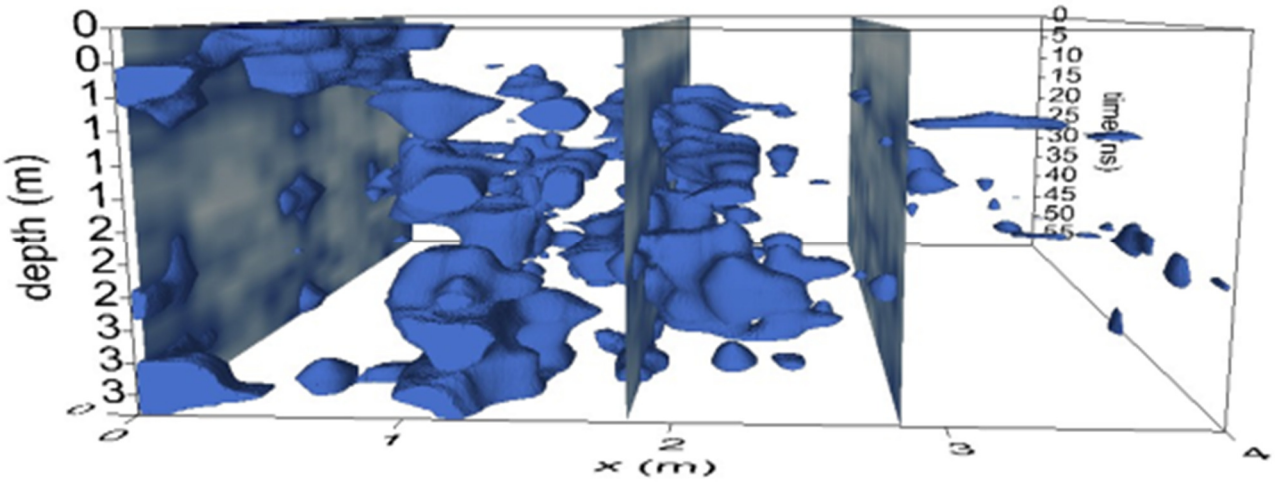

Figure 18. Isomorphic Perspective View of GPR Block B.

Chapter 4. Interpretative Summary

The LAMAR Institute's GPR survey at 110 East Oglethorpe Avenue provides a layer of GIS information that should prove useful and informative in future management of the McIntosh house or for other historic areas of Savannah. The research design for this survey was of a general, exploratory nature. For the building's rear lot, potential targets included earlier buildings no longer extant, wells, privies, and/or sheet refuse midden. Within the McIntosh House itself, researchers sought to locate targets beneath the concrete floor that could possibly include earlier building foundations, refuse pits, wells, or layers of previous occupational debris. These types of information would prove useful in dating the age of the current structure and in determining if this town lot contained earlier buildings. The GPR survey yielded reliable radar reflections to a depth of approximately 3 meters (about 9.8 feet) below ground.

Four separate Sanborn Fire Insurance Maps of the study property, dating from 1874 to 1916, all show the dwelling house at its present location and a second building in the rear at 110 East Oglethorpe Avenue. This building existed and its foundations were a target for the GPR survey. No patterning in the radar data, however, conforms to the general outline of this building. The survey of the rear yard reveals many subsurface radar reflections. Many of these likely represent modern (20th century or later) underground utilities. Other radar anomalies, such as the linear mass that lines the western edge of the lower part of Block A may represent structural features, such as a footing for a brick wall (Figure 12). Many of the anomalies that are located on the northern one-third of this image are likely modern utilities.

One large, sub-rectangular radar reflection in Block A is of particular interest (Figure 13). It is located on the eastern side of the lot. The age and function of this suspected feature is not known. What we do know is that the radar reflection begins below the ground surface, so the top of the feature is buried and lying horizontal. It is aligned with the town grid and its dimensions are about 3 m north-south and 1.5 m east-west. The top of the feature lies at about 25 cm below ground. This may represent a modern feature, although its age and function cannot be determined without archaeological excavation.

Radar reflections on the western edge of Block B probably indicate a feature that may be part of the subsurface structure of the massive brick chimney. The radar anomaly is irregular in outline and it measures about 1.5 m north-south by 75 cm east-west (Figure 14). It originates just below the surface and extends about 1.5 m below the floor. This chimney appears to be quite ancient and had been sealed up in the wall prior to the SCAD demolition. Block B contains numerous radar reflections but none of these appear to represent an organized building structure. Some of them may represent subsurface cultural features but this can only be determined by archaeological excavation.

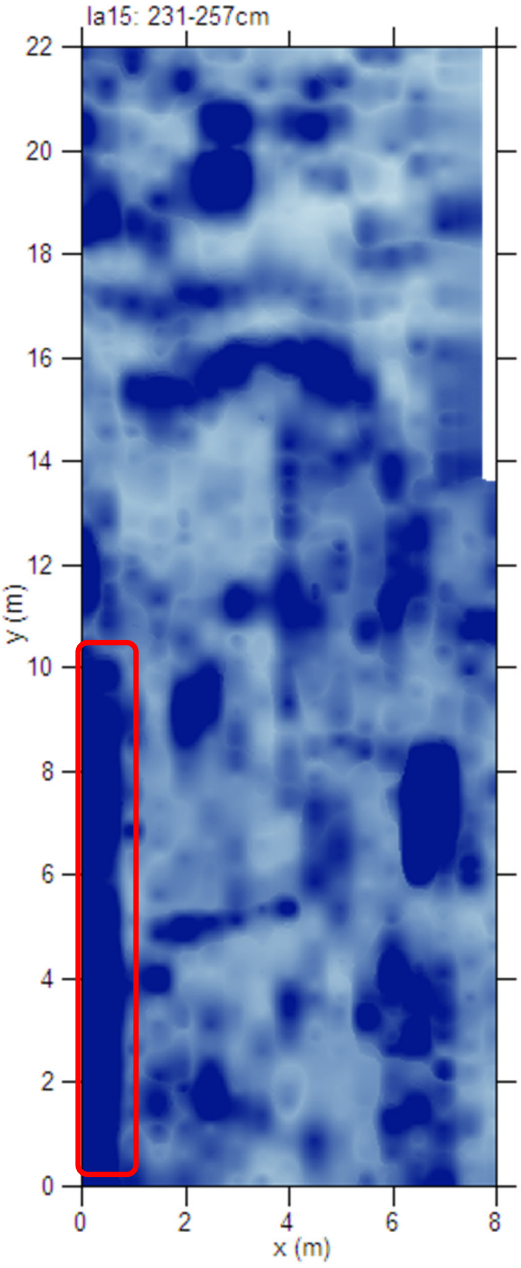

Figure 19. Possible Brick Wall (outlined in red) in GPR Block A, Rear Yard, McIntosh House (Grid North is up).

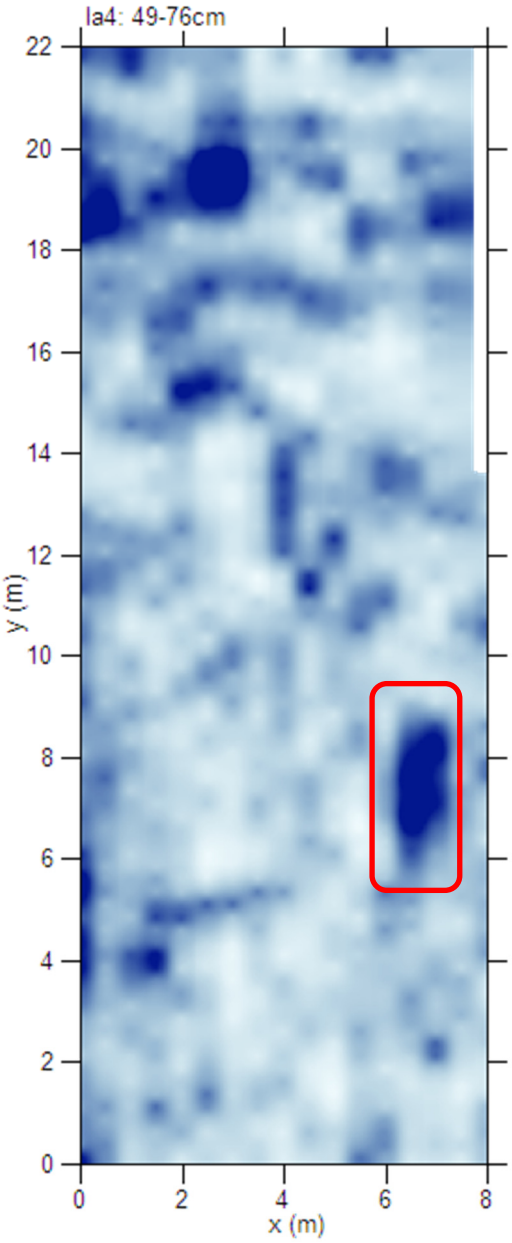

Figure 20. Potential Feature (outlined in red) in GPR Block A, Rear Yard, McIntosh House (Grid north is up).

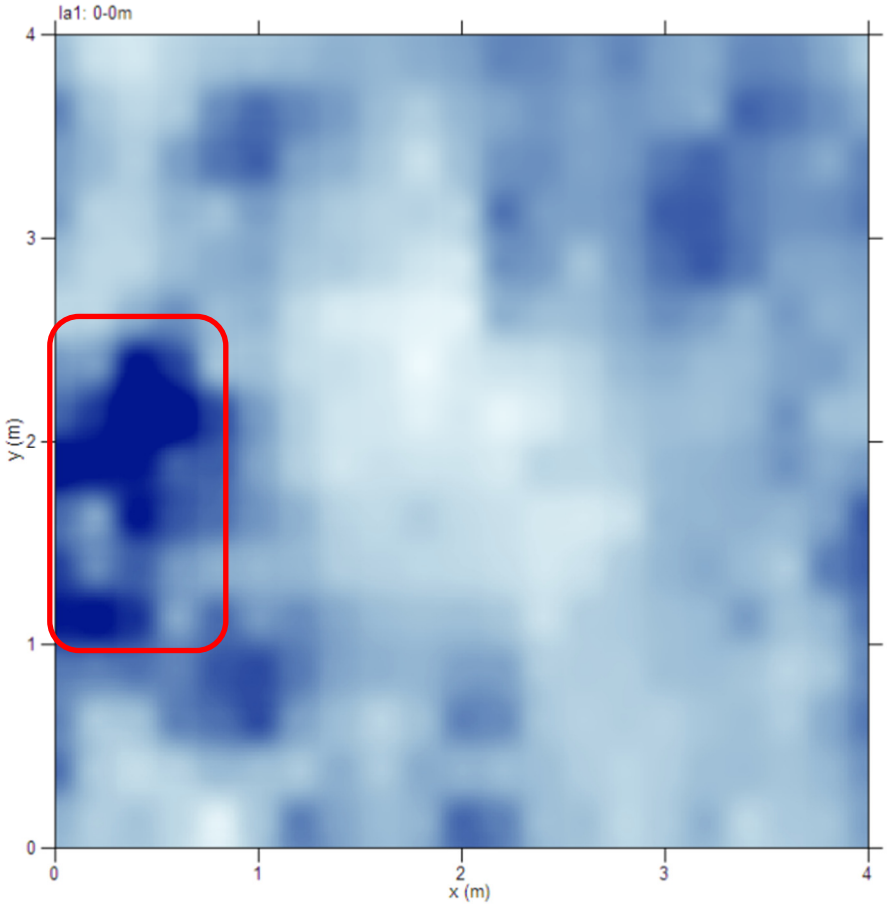

Figure 14. Subsurface Feature Possibly Related to Chimney, GPR Block B, Southwest Room, McIntosh House (Grid North Is up).

Summary

In 2016 the LAMAR Institute research team completed Ground Penetrating Radar (GPR) survey on a portion of the Lachlan McIntosh house and yard at 110 East Oglethorpe Avenue, Savannah, Georgia. This research was done in conjunction with renovations to the property by the Savannah College of Art and Design (SCAD). GPR Block A, which was located in the rear yard, contained many radar anomalies. Many of these, particularly those located on the northern one-third of the sample, probably represent modern utilities. A long, linear radar reflection is located along the western edge of Block A and it may represent the footing for an older brick building wall. A strong sub-rectangular anomaly located on the eastern side of Block A is of interest and it may represent an older cultural feature.

GPR Block B examined a portion of the building's interior. An area of strong radar reflection was present on the eastern side of the southwest room of the ground floor/basement. This feature may be associated with an existing brick chimney that is located further to the east, or it possibly represents the footing for an earlier chimney that was located in the same general area of the dwelling.

Figure 15 shows the plan maps of GPR Blocks A and B superimposed onto a modern aerial view of the study vicinity. These two GPR samples provide a glimpse into the subterranean world at 110 East Oglethorpe Avenue. The numerous radar reflections in both blocks may include important historical secrets from centuries past, while others represent more mundane modern utility trenches or other similar features. Without any archaeological excavation the story ends here.

Figure 21. Plan Maps of GPR Blocks A and B Superimposed Onto Modern Aerial Photograph of Study Area (Google Earth 2016.

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